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PATENT

Attorney Docket No. 75657

Date: May 9, 1997

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ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Transmitted for filing herewith is the patent application of:

Inventor(s): Jerry Dwayne Hulse and William Henry Wright

For: OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT MOLDED LIP

This new application is for: ☒ Original ☐ Continuation ☐ Divisional
☐ Continuation-In-Part ☐ Design ☐ Plant

Enclosed are:

- ☒ Three (3) sheet(s) of drawings.
- ☒ an assignment of the inventor(s) to PrisTech, Inc., along with the \$40.00 assignment fee.
- ☐ a certified copy of application no. filed .
- ☒ a Combined Declaration and Power of Attorney executed by the inventor(s).
- ☐ Verified Statement that this is a filing by a small entity under 37 CFR 1.9 and 1.27.
- ☐ Preliminary Amendment.
- ☐ Information Disclosure Statement with Form PTO-1449.
- ☐ Submission of Sequence Listing.
- ☐ Other:

The fee has been calculated as follows:

(Col. 1)			(Col. 2)		SMALL ENTITY		OTHER THAN A SMALL ENTITY		DESIGN FEES	
FOR:	NO. FILED	NO. EXTRA	RATE	FEE	RATE	FEE	SMALL	LARGE		
BASIC FEE				\$ 385		\$ 770	\$ 160	\$ 320		
TOTAL CLAIMS	20 -20=	* 0	x 11=	\$	x 22=	\$ 0				
INDEP CLAIMS	3 - 3=	* 0	x 40=	\$	x 80=	\$ 0				
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENTED			+130=	\$	+ 260=	\$				
			TOTAL	\$	TOTAL	\$	\$	\$		

- ☐ Please charge my Deposit Account No. 12-1216 in the amount of \$.
- ☒ Checks in the amounts of \$770.00 (filing fee) and \$40.00 (recording fee) is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 12-1216. A duplicate copy of this sheet is enclosed.
 - ☒ Any additional filing fees required under 37 CFR 1.16.
 - ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

LEYDIG, VOIT & MAYER, LTD.

Regina M. Anderson
Regina M. Anderson, Reg. No. 35820
One of the Attorneys for Applicant(s)
Leydig, Voit & Mayer, Ltd.
Two Prudential Plaza, Suite 4900
180 North Stetson
Chicago, Illinois 60601-6780
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

In re Application of HULSE and WRIGHT
Attorney Docket No. 75657

CERTIFICATE OF MAILING BY "EXPRESS MAIL"

"Express Mail" mailing label number TB17071240X

Date of Deposit: May 9, 1997

I hereby certify that the following documents:

- ☒ New Patent Application in the name of Jerry Dwayne Hulse and William Henry Wright for OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT MOLDED LIP, including 14 pages of specification, 3 pages of claims, 1 pages of abstract, and 3 sheets of drawings;
- ☒ Combined Declaration and Power of Attorney executed by the inventors;
- ☐ Verified Small Entity Statement;
- ☐ Preliminary Amendment;
- ☐ Information Disclosure Statement with Form PTO-1449;
- ☐ Submission of Sequence Listing; and
- ☒ Other: Assignment Recordation Form Cover Sheet and Assignment

are being deposited with the United States Postal Service "Express Mail Post Office To Addressee" Service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Neil Vanegas

(Typed or printed name of person mailing paper or fee)

Neil Vanegas

(Signature of person mailing paper or fee)

APPLICATION FOR LETTERS PATENT

Applicant(s) JERRY DWAYNE HULSE and WILLIAM HENRY WRIGHT

Title OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT MOLDED LIP

Serial No. _____ Filed _____

Group No. _____

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S P E C I F I C A T I O N

TO ALL WHOM IT MAY CONCERN:

Be it known that JERRY DWAYNE HULSE and WILLIAM HENRY WRIGHT, citizen of the United States of America, and resident at 19245 Pinto Way, Apple Valley, California, and 24332 Highway 58, Hinkley, California, respectively, have invented a certain new and useful OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT MOLDED LIP of which the following is a specification.

OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT MOLDED LIP**TECHNICAL FIELD OF THE INVENTION**

5 The present invention relates to an apparatus for facilitating the delivery of a child during childbirth, and more specifically relates to vacuum extractors for use during childbirth.

BACKGROUND OF THE INVENTION

10 During childbirth, the birth mother is sometimes unable to deliver the child without assistance. In some cases, all that is required is for a nurse, midwife, or attending physician to push down on the birth mother's upper abdomen when she bears down during delivery. In
15 other cases, it is necessary for a physician to perform a cesarean section. For those cases in between the two extremes, some sort of intermediate assistance is often required. Such intermediate assistance generally entails the use of some sort of device to aid in the delivery of
20 the child. These devices may likewise be required to assist a physician during particularly difficult cesarean sections.

One example of such a device is forceps. Forceps, however, tend to be bulky and difficult to operate. In
25 addition, the use of forceps, at the very least, is uncomfortable for the mother and child and risks injury to both.

An alternative device to forceps is a vacuum extractor device, like the one described in U.S. Patent
30 No. 3,202,152. Such a device comprises a cup, which is placed onto the child's head. The device further comprises an elongated hollow stem, which is used to position the cup onto the child's head and through which vacuum pressure is introduced into the cup. The
35 introduction of vacuum pressure into the cup results in suction between the cup and the child's head. The resultant suction is then used to extract the child from

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the birth canal by pulling in an appropriate direction on some sort of gripping device coupled to the vacuum extractor. A similar device is manufactured and sold by Pristech, Inc. of Cucamonga, CA.

5 Although vacuum extractor devices, like the one
manufactured and sold by PrisTech, are widely used, the
relatively flexible edge of the cup, which facilitates
the formation of a good seal between the cup and the
child's head, could, due to its relative thinness, abrade
10 or injure the child or mother. U.S. Patent Nos.
5,163,944 and 5,281,229 disclose vacuum extractors which
attempted to address this potential problem, by lining
the cup with a second cup formed of a soft, pliable
material, which, when assembled, wraps around the edge of
15 the cup. Thus, the first cup provided the relatively
rigid structure of the extractor cup while the second cup
provided a soft, relatively friendly contact with the
child's head. While this vacuum extractor design reduced
the possibility abrasion or injury to maternal tissues
20 and the child by cushioning the contact between the
vacuum extractor cup and the adjacent tissue, the design
was not without its disadvantages. Given that the soft
material from which the liner is formed is opaque, the
liner occludes vision through the cup. Accordingly, the
25 liner may make it difficult to visually determine if the
cup is properly positioned on the child's head or to
visually monitor the fetal tissue during delivery to
ensure that the amount of suction is appropriate. In
addition, if the vacuum extractor is not used properly,
30 the liner may roll off the edge of the cup.

The present invention seeks to overcome the problems of the prior art. Accordingly, it is an object of the present invention to provide a vacuum extractor, which offers the advantages attendant an extractor having a
35 liner, without compromising visibility through the cup and without risking the liner rolling off the edge of the cup. Another object of the present invention is to

provide a softer contact between the extractor and child. These and other objects and advantages of the present invention will become apparent from the disclosure herein.

5

BRIEF SUMMARY OF THE INVENTION

The present invention provides an obstetrical vacuum extractor comprising a vacuum cup, which is substantially in the shape of a bell with an outwardly flaring edge and a basal opening. A hollow stem adapted for connecting with a vacuum source communicates with the inner cavity and basal opening of the cup. The cup is also provided with at least one handle to facilitate maneuvering of the cup during delivery. In accordance with the invention, the extractor further comprises a secondary lip, which is molded from a relatively soft elastomeric material, and is secured on the outwardly flaring edge of the vacuum cup. The relatively soft lip presents a friendly edge to the maternal and fetal tissue as the cup is positioned and during delivery. Further, because the relatively soft second material is disposed only along the edge of the cup, the physician can better observe the interaction between the cup and the child's head. Accordingly, the physician can readily observe whether the cup is properly positioned and if the level of suction is appropriate.

Preferably, the edge of the vacuum cup adjacent the basal opening includes a structure which enhances the attachment of the molded lip. While various designs may be appropriate, the vacuum cup may include one or more protrusions, such as annular ridges, which extend about the periphery of the outwardly flaring edge of the cup. The ridges provide additional gripping surfaces for the softer material of the secondary molded lip.

Alternately, the flaring edge of the cup may be provided with one or more bores which extend through the edge of the cup. The bores are disposed about the periphery of the flaring edge, preferably at

substantially regular intervals. When the secondary lip is molded to the flaring edge of the cup, the elastomeric material flows into the bores and along both the inner and outer surfaces of the flaring edge of the cup to
 5 secure the secondary lip to the cup.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of an obstetrical vacuum extractor constructed in accordance with teachings of the
 10 present invention.

FIG. 2 is a cross-sectional view of the obstetrical vacuum extractor of FIG. 1, taken along line 2-2 of FIG. 1.

FIG. 3 is a plan view of the obstetrical vacuum extractor of FIG 1, taken along line 3-3 of FIG. 2.
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FIG. 4 is an enlarged, fragmentary cross-sectional view of the obstetrical vacuum extractor of FIG. 1, taken along line 4-4 of FIG. 3.

FIG. 5 is an enlarged, fragmentary cross-sectional view of the obstetrical vacuum extractor of FIG. 1, taken along line 5-5 of FIG. 3.
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FIG. 6 is a plan view of an alternate embodiment of the invention, partially broken away to show the cross-section of a portion of the cup.

FIG. 7 is an enlarged, fragmentary cross-sectional view of the cup partially broken away in FIG. 6.
 25

While the invention will be described in connection with certain preferred embodiments, there is no intent to limit it to those embodiments. On the contrary, the
 30 intent is to cover all alternatives, modifications, and equivalents included within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to the drawings, there is shown in FIG. 35 1 an obstetrical vacuum extractor 10 for use in assisted delivery techniques. The vacuum extractor 10 comprises a

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hollow vacuum cup 12 having a base 13 and an annular side wall 14 which opens into a basal opening 17 for placement against the head of a child. In the embodiment illustrated, the vacuum cup 12 is in the general shape of a bell having an outwardly flaring edge or apron 16 along the basal opening 17. The overall dimensions of the vacuum cup 12 are such that the vacuum cup 12 may be easily inserted into the birth canal and properly positioned onto the child's head.

To facilitate delivery, the obstetrical vacuum extractor 10 is provided with a handle 18, which is coupled to the cup 12 by an elongated stem 20 in the illustrated embodiment. In order to establish a vacuum within the vacuum cup 12 and at the basal opening 17, the elongated stem 20 is hollow, or includes an interior bore 22, which opens into the interior of the hollow vacuum cup 12. To facilitate coupling the hollow elongated stem 20 to a vacuum source (not shown), the outer surface of its distal end is provided with a series of ribs 26 which extend about the circumference of the stem 20. It will thus be appreciated that when a suitable vacuum hose, such as flexible plastic tubing (not shown), is disposed about the distal end 24 of the stem 20, the ribs 26 ensure an airtight connection with the vacuum hose.

It will be appreciated by those skilled in the art that the cup 12 must be sufficiently rigid to withstand the vacuum pressure developed within the cup 12 for extraction of the child during delivery. Typically, the vacuum pressure developed within the cup 12 during use ranges from about 15 to 23 inches Hg (approximately 39-59 cm Hg). Accordingly, the cup 12 must be molded of a sufficiently rigid material and the walls of the cup must be sufficiently thick to withstand the vacuum pressure. A low density polyethylene such as Dow Chemical #722 has been determined to be appropriate. Additional structural strength may be provided by ribs 28 molded into the interior of the side wall 14 of the cup 12.

The illustrated vacuum cup design 12 includes eight ribs 28 disposed equidistant about the interior of the cup 12. The ribs 28 run from the base 13 and along a portion of the side wall 14 of the cup 12. It will be appreciated, however, that the cup could include a greater, or lesser number of ribs, or no ribs, as desired and as allowed by the rigidity of the material from which the cup is molded.

To better distribute the applied vacuum within the cup 12, the vacuum extractor 10 may be provided with a disk 30 disposed subjacent and spaced slightly away from the opening of the bore 22 of the elongated stem 20 into the interior of the hollow vacuum cup 12. The disk 30 is coupled to the base 13 of the cup 12 by a pair of pegs 32 which are received within openings 34 of the disk 30. The ends of the pegs 32 extending through the openings 34 are flattened by sonic welding, or the like to secure the disk 30 to the cup 12. The disk 30 is further provided with a central opening 36 through which the vacuum communicates with the interior of the cup 12. Additionally, the periphery of the disk 30 is slightly smaller than the interior of the vacuum cup 12 (as may be seen in FIG. 2) such that the vacuum flow may also be distributed along the interior of the side wall 14 of the cup.

Preferably, the hollow vacuum cup 12, elongated stem 20 and handle 18 are unitarily molded from a substantially translucent, flexible plastic, such as polyethylene. Those skilled in the art will appreciate that the cup must be sufficiently flexible to be inserted into the birth canal and properly placed on the child's head, yet sufficiently rigid to withstand the vacuum developed within the bore 22 and cup 12. Further, the extractor 10 must be sufficiently rigid to permit the physician to positively manipulate the extractor 10 during extraction.

In accordance with the invention, the extractor 10 is provided with a lip 40 which is molded of a second relatively softer material and is secured along the outwardly flaring edge 16 of the vacuum cup 12. The lip
5 40 is preferably made of an elastomeric material such as Dynaflex® G2735 by GLS Corporation Thermoplastic Elastomer Division. Those skilled in the art will appreciate that the relatively soft molded lip 40 presents a "friendly" surface for contacting the child's
10 head, as well as maternal tissues. Further, the relatively soft lip 40 is sufficiently flexible to provide a good seal with the child's head and to conform to any irregularities or hair present on the head. Moreover, because the lip 40 presents a relatively soft
15 contact with the child's head, the cup 12 may be molded of a relatively rigid material without compromising the safety, comfort, or performance.

The cup 12 and lip 40 may be molded by conventional molding techniques. For example, the extractor 10 may be
20 molded by dual material molding techniques. That is, the cup 12 and stem 20 may be molded in a conventional mold. With the molded cup and stem remaining in the mold assembly, the portion of the mold adjacent the basal opening 17 may be replaced with a second mold component,
25 and the second material may be introduced into the mold to form the lip 40. Alternately, the lip 40 may be post-molded to a previously molded cup 12 or separately molded and secured to a cup 12.

Preferably, the seal between the lip 40 and cup 12
30 is enhanced by chemical or mechanical means. In this regard, a portion of the surface of the vacuum cup 12 may be treated with an appropriate adhesive or the like to enhance adhesion between the softer material of the lip 40 and the relatively more rigid material of the vacuum
35 cup 12.

Alternately, mechanical means may be used to enhance adhesion between the lip 40 and the vacuum cup 12. For

example, as shown in FIGS. 1-5, the side wall 14 may be provided with one or more bores 42 extending therethrough. In the embodiment illustrated, the cup 12 is provided forty bores 42 which are approximately
5 equally spaced around the outwardly flaring edge 16 and are approximately equally spaced from the end 44 of the cup 12. It will be appreciated, however, that a greater or lesser number of bores 42 of different shapes may be provided and the bores 42 may be disposed at disparate
10 intervals around the side wall 14 and at varied distances from the edge 44 of the cup 12.

As may be seen in FIG. 4, as the relatively softer material of the lip 40 is molded along the edge 44 and the side wall 14, the material flows in and through the
15 bores 42 to create a mechanical coupling of the lip 40 to the cup 12. As shown in FIGS. 4 and 5, the soft material of the lip 40 extends about 0.35 inch along the outside and inside surfaces of the side wall 14 of the vacuum cup 12 and approximately 0.25 inch beyond the edge 44 of the
20 cup 12.

An alternate, currently preferred embodiment of the invention is illustrated FIGS. 6 and 7. For clarity, the components of the embodiment shown in FIGS. 6 and 7 which have been previously discussed with regard to the
25 embodiment shown in FIGS. 1-5 will be identified using the same numerals followed by the letter "a." In this embodiment, the side wall 14a has a portion 46 with a substantially uniform thickness from which a reduced thickness portion 48 extends outward. In order to
30 enhance adhesion between the side wall 14a and the lip 40a, a pair of circumferential ridges are disposed along the outer surface of the side wall 14a. It will thus be appreciated by those skilled in the art that the ridges
50 encircling the side wall 14a of the cup 12a increase the surface area for bonding as well as providing an
35 anchor point for the softer molded material of the lip 40a to evenly and consistently bond to the cup 12a during

the molding process. In this embodiment, the softer material of the lip 40a extends about 0.38 inch along the outside surface of the side wall 14a, extends only about .015 inch along the inside surface of the side wall 14a.

5 While the vacuum extractor according to the current invention has been described in connection with a bell-shaped cup having an outwardly flaring edge, it will be appreciated that the lip molded of the second softer material may be utilized with alternate cup designs.
10 Moreover, alternate methods for enhancing adhesion and bonding of the second material of the lip to the more rigid material of the cup may be used. For example, alternate designs of projections may be utilized, preferably along the outer surface of the side wall 14.
15 Alternately, a separately molded lip may be bonded to the cup by methods such as adhesion, laser technology, or sonic welding.

In summary, the present invention overcomes disadvantages inherent in currently available obstetrical vacuum extractors. The invention minimizes the potential
20 risk of abrasion or injury to the child or the mother by providing a relatively flexible edge on a relatively rigid cup. Further, the lip may be molded of a relatively opaque material while the cup itself is molded of a relatively transparent material such that the
25 physician may readily monitor the condition of the fetus scalp throughout delivery. Also, inasmuch as the lip is secured, and preferably molded and mechanically coupled, to the side walls of the cup, the risk of the lip rolling off the edge of the cup during improper use is
30 substantially eliminated.

While this invention has been described with emphasis upon preferred embodiments, it will be obvious
35 to those of ordinary skill in the art that the preferred embodiments may be varied. Accordingly, this invention

includes all modifications encompassed within the spirit and scope of the appended claims.

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WHAT IS CLAIMED IS:

1. An obstetrical vacuum extractor for placement on a child's head for use during childbirth, the obstetrical vacuum extractor comprising, in combination, a vacuum cup formed of a first material, the vacuum cup having side wall defining a hollow interior cavity, the side wall having a side wall edge forming a cup opening, the vacuum cup further including a vacuum opening communicating with the interior cavity of the vacuum cup and being adapted for connection to a vacuum source;

a lip formed of a polymeric second material, the second material being flexible relative to the first material, the lip being secured along said side wall edge adjacent the cup opening; and

a handle coupled to the vacuum cup.

2. The obstetrical vacuum extractor of claim 1 wherein the vacuum cup is substantially in the shape of a bell, and the side wall includes a generally outwardly flaring edge, the lip being molded to the outwardly flaring edge.

3. The obstetrical vacuum extractor of claim 1 wherein the lip extends on the order of 0.20 to 0.40 inches beyond the side wall edge.

4. The obstetrical vacuum extractor of claim 1 wherein the lip is molded along a portion of the side wall.

5. The obstetrical vacuum extractor of claim 1 wherein the cup is substantially transparent such that it does not occlude vision through to the interior cavity of the cup.

6. The obstetrical vacuum extractor of claim 1 wherein the lip is postmolded to the vacuum cup.

7. The obstetrical vacuum extractor of claim 1 wherein the second material is an elastomeric material.

8. The obstetrical vacuum extractor of claim 1 further comprising means for enhancing adhesion of the lip to the vacuum cup.

9. The obstetrical vacuum extractor of claim 1 wherein the side wall further comprises at least one opening extending therethrough, said opening being disposed substantially adjacent the side wall edge, the second material of the lip being molded into the opening to mechanically couple the lip to the vacuum cup.

10. The obstetrical vacuum extractor of claim 9 comprising at least two openings, the openings being circumferentially disposed around the side wall.

11. The obstetrical vacuum extractor of claim 1 wherein the side wall further comprises at least one rib, the second material of the lip being molded to the at least one rib.

12. The obstetrical vacuum extractor of claim 11 wherein the side wall includes an outer substantially circumferential surface, and the at least one rib extends about at least a portion of the circumferential surface.

13. The obstetrical vacuum extractor of claim 11 comprising at least two ribs.

14. The obstetrical vacuum extractor of claim 1 further comprising an adhesive applied to a portion of the side wall substantially adjacent the side wall edge

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such the second material of the lip is molded along the adhesive.

15. The obstetrical vacuum extractor of claim 1 wherein the side wall further comprises at least one projection extending outwardly from the side wall, the lip being molded along the at least one projection.

16. An obstetrical vacuum extractor comprising:
a vacuum cup substantially in the shape of a bell with an outwardly flaring edge and a cup opening;
a post-molded lip on the outwardly flaring edge of the vacuum cup;
a hollow, elongated stem integrally formed with the cup and communicating with the cup opening, the distal end of the stem being adapted for connection to a vacuum source; and
a gripping device coupled to the stem.

17. A method of making an obstetrical vacuum extractor for use during childbirth comprising the steps of:
molding a hollow vacuum cup of a first material, the cup having a cup opening;
molding a lip of a polymeric second material along the cup opening, the second material being flexible relative to the first material.

18. The method of claim 17 wherein the step of molding a hollow vacuum cup of a first material includes the step of molding a substantially transparent cup wall.

19. The method of claim 17 wherein the second material is an elastomeric material.

20. The method of claim 17 wherein the first material is a polyethylene.

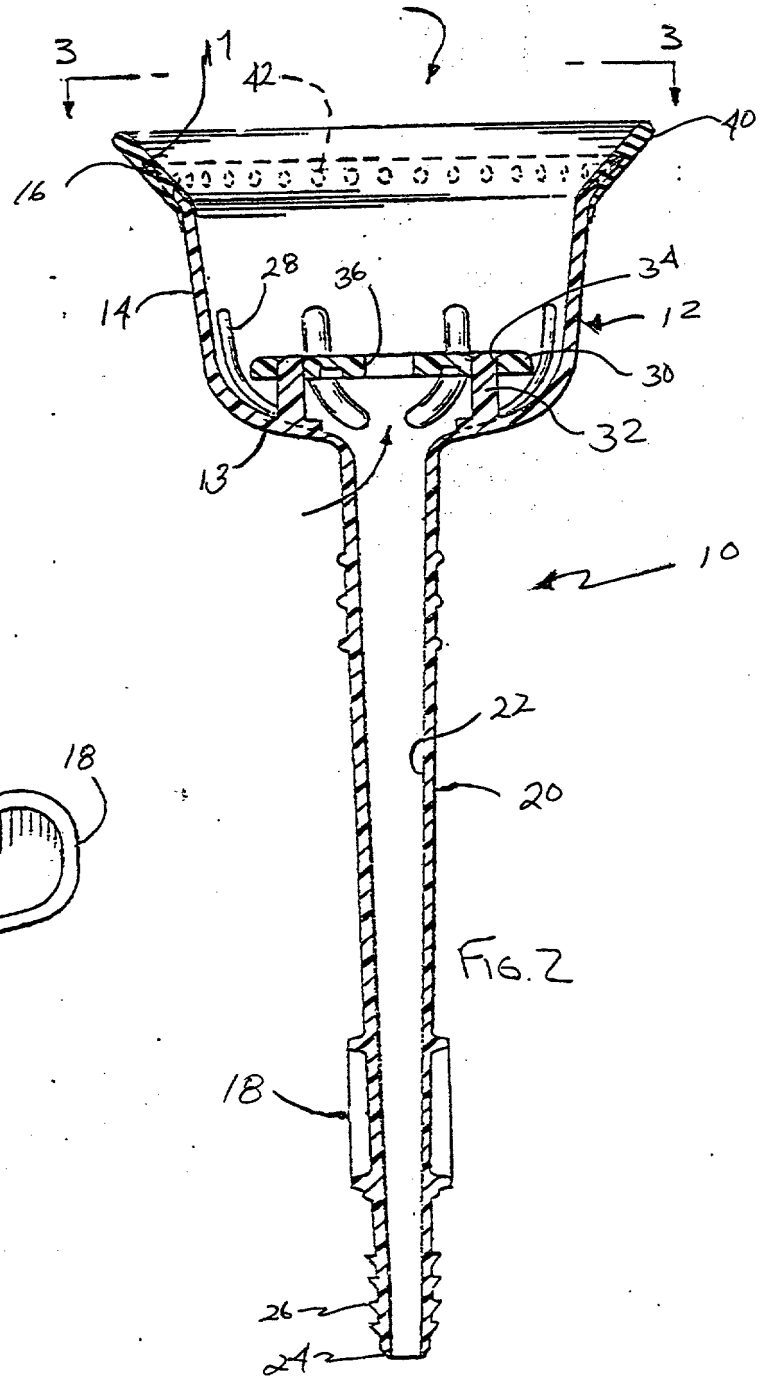
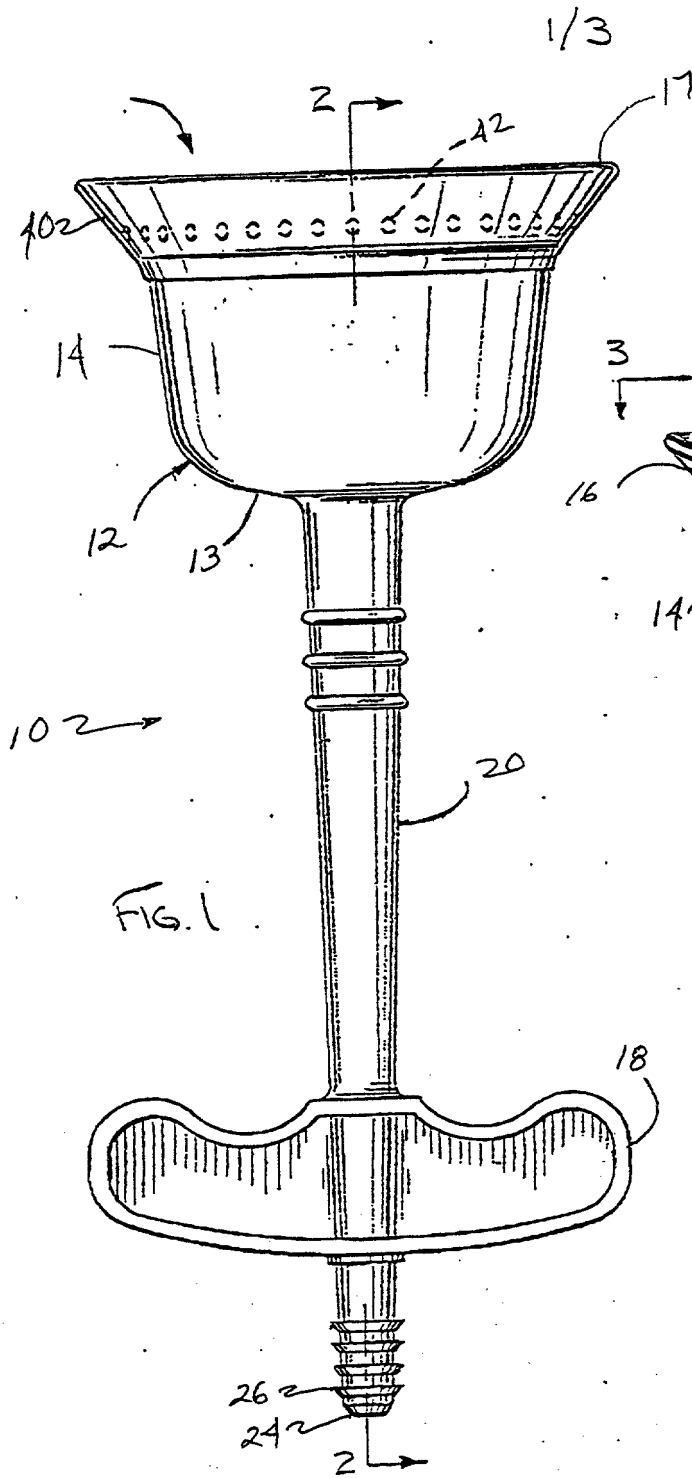
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ABSTRACT

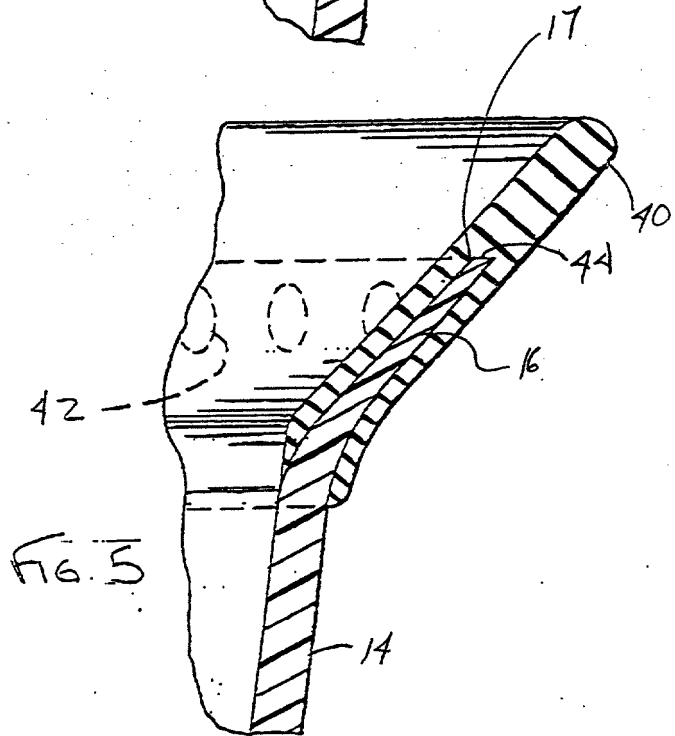
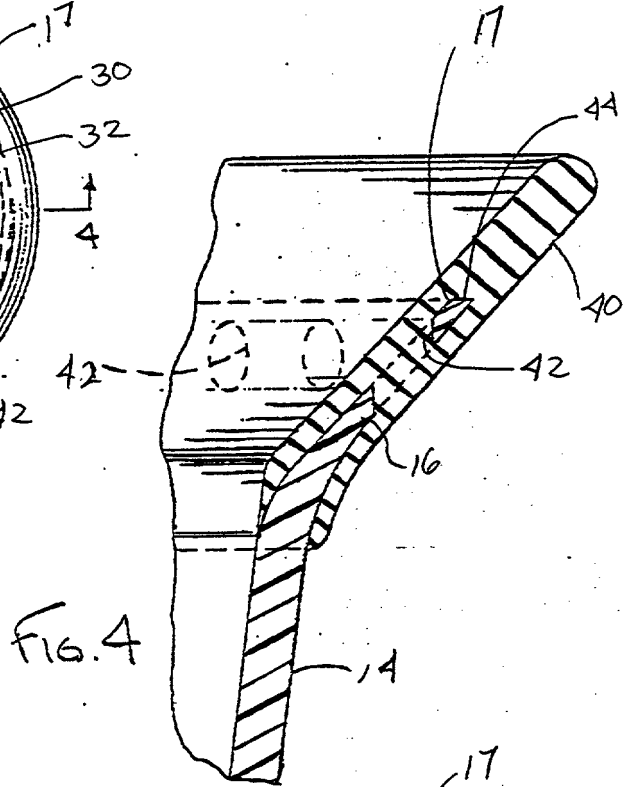
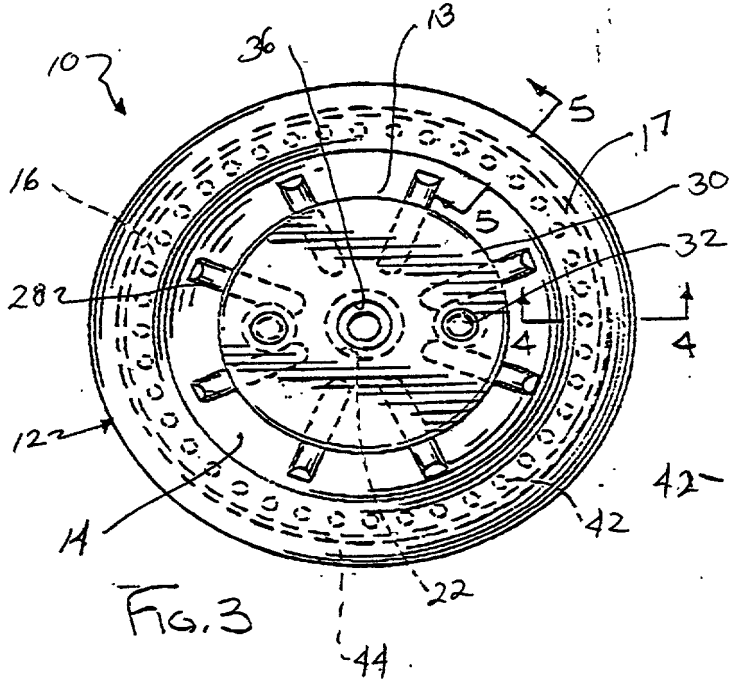
The obstetrical vacuum extractor comprising a vacuum cup molded of a first, relatively rigid material, with a lip of a second, relatively soft material secured along the basal opening. An elongated hollow stem which may be coupled to a vacuum source communicates with the interior and, accordingly, the basal opening of the vacuum cup. The first, relatively rigid material of the cup is preferably substantially transparent so that the physician may readily monitor the condition of the fetal scalp throughout delivery.

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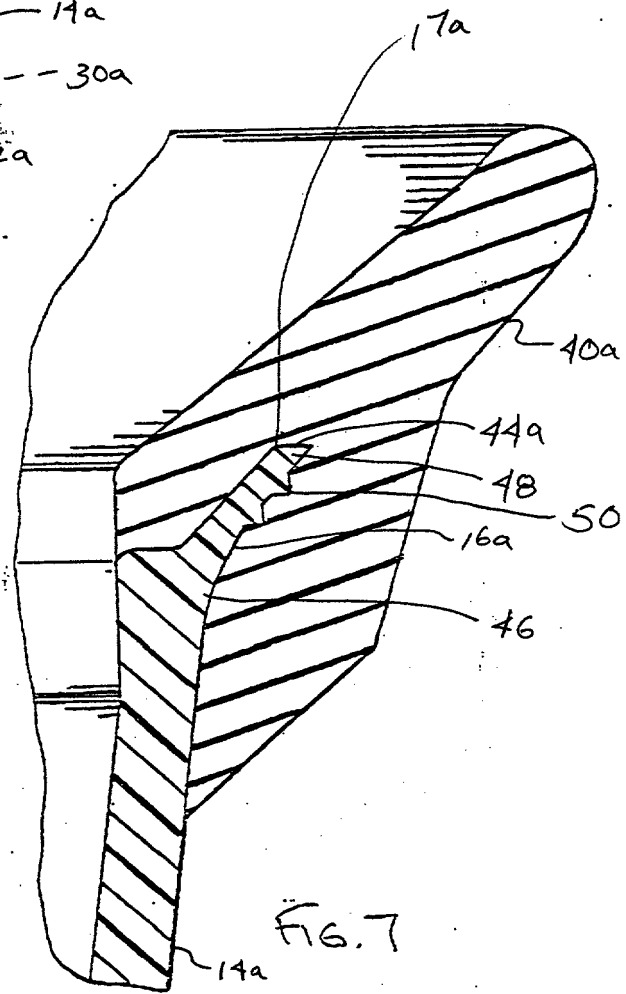


Fig. 6

COMBINED DECLARATION AND POWER OF ATTORNEY

As below named inventor, I hereby declare that

This declaration is of the following type:

- ☒ original ☐ design ☐ supplemental
☐ national stage of PCT
☐ divisional ☐ continuation ☐ continuation-in-part

My residence, post office address, and citizenship are as stated below next to my name. I believe I am the original, first, and sole inventor (*if only one name is listed below*) or an original, first, and joint inventor (*if plural names are listed below*) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

OBSTETRICAL VACUUM EXTRACTOR CUP WITH SOFT
MOLDED LIP

the specification of which:

- ☒ is attached hereto.
☐ was filed on _____ as Serial No. _____ and was amended on _____ (*if applicable*).
☐ was filed by Express Mail No. _____ as Serial No. *not known yet*, and was amended on _____ (*if applicable*).
☐ was described and claimed in PCT International Application No. _____ filed on _____ and as amended under PCT Article 19 on _____ (*if any*).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

COUNTRY	APPLICATION	DATE OF FILING (day,month,year)	PRIORITY CLAIMED UNDER 35 USC 119		
			YES		NO
			YES		NO
			YES		NO

I hereby claim the benefit pursuant to Title 35, United States Code, § 119(e) of the following United States provisional application(s):

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PRIOR U.S. PROVISIONAL APPLICATIONS CLAIMING THE BENEFIT UNDER 35 USC 119(e)	
APPLICATION NO.	DATE OF FILING

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 USC 120					
U.S. APPLICATIONS			Status (check one)		
U.S. APPLICATIONS	U.S. FILING DATE		PATENTED	PENDING	ABANDONED
1. 0 /					
2. 0 /					
3. 0 /					
PCT APPLICATIONS DESIGNATING THE U.S.			Status (check one)		
PCT APPLICATION No.	PCT FILING DATE	U.S. SERIAL NOS. ASSIGNED (if any)	PATENTED	PENDING	ABANDONED
4					
5.					
6.					

DETAILS OF FOREIGN APPLICATIONS FROM WHICH PRIORITY CLAIMED UNDER 35 USC 119 FOR ABOVE LISTED U.S./PCT APPLICATIONS				
ABOVE APPLN. NO.	COUNTRY	APPLICATION NO.	DATE OF FILING (day,month,yr)	DATE OF ISSUE (day,month,yr)
1.				
2.				
3.				
4.				
5.				
6.				

As a named inventor, I hereby appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Berton Scott Sheppard, Reg. 20922
James B. Muskal, Reg. 22797
Dennis R. Schlemmer, Reg. 24703
Gordon R. Coons, Reg. 20821
John E. Rosenquist, Reg. 26356
John W. Kozak, Reg. 25117
Charles S. Oslakovic, Reg. 27583
Mark E. Phelps, Reg. 28461
H. Michael Hartmann, Reg. 28423
Bruce M. Gagala, Reg. 28844
Charles H. Morier, Reg. 30874
John Kilyk, Jr., Reg. 30763
Robert F. Green, Reg. 27555
John B. Conklin, Reg. 30369
James D. Zalewa, Reg. 27848

John M. Belz, Reg. 30359
Brett A. Hesterberg, Reg. 31837
Jeffrey A. Wyand, Reg. 29458
Richard M. Johnson, Reg. 33405
Paul J. Komiczky, Reg. 32849
Pamela J. Ruschau, Reg. 34242
Steven P. Petersen, 32927
John M. Augustyn, Reg. 33589
Christopher T. Griffith, Reg. 33392
Frederick N. Samuels, Reg. 37415
Wesley O. Mueller, Reg. 33976
Jeremy M. Jay, Reg. 33587
Jeffrey B. Burgan, Reg. 35463
Eley O. Thompson, Reg. 36035
Mark Joy, Reg. 35562

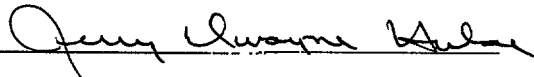
Regina M. Anderson, Reg. 35820
Allen E. Hoover, Reg. 37354
David M. Airan, Reg. 38811
Michael H. Tobias, Reg. 32948
Xavier Pillai, Reg. 39799
G. Russell Thill, Reg. 39854
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Carol Larcher, Reg. 35243
Thomas A. Miller, Reg. 40091
David J. Schodin, Reg. 41294
Paul L. Ahern, Reg. 17020
Theodore W. Anderson, Reg. 17035
Noel I. Smith, Reg. 18698

I further direct that correspondence concerning this application be directed to LEYDIG, VOIT & MAYER, LTD.,
Two Prudential Plaza, Suite 4900, 180 North Stetson, Chicago, Illinois 60601-6780, Telephone (312) 616-5600.

I hereby declare that all statements made herein of my own knowledge are true, that all statements made on
information and belief are believed to be true, that these statements were made with the knowledge that willful false
statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of
the United States Code, and that such willful false statements may jeopardize the validity of the application or any
patent issued thereon.

Full name of sole or first inventor: JERRY DWAYNE HULSE

Inventor's signature



Date May 8, 1997

Country of Citizenship: United States of America

Residence: 19245 Pinto Way, Apple Valley, California 92308

Post Office Address: Same as above

Full name of second joint inventor, if any: WILLIAM HENRY WRIGHT

Inventor's signature



Date May 8, 1997

Country of Citizenship: United States of America

Residence: 24332 Highway 58, Hinkley, California 92347

Post Office Address: Same as above